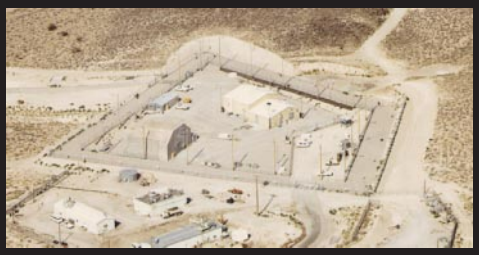
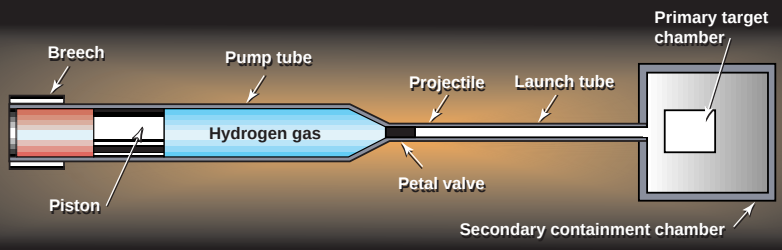
Joint Actinide Shock Physics Experimental Research (JASPER) Facility

The JASPER Facility, located at the Nevada Test Site, is a joint organization research facility for the study of actinides and toxic materials at extreme conditions (i.e., high pressures, temperatures, strain, and strain rates). Studies supplement current equation-of-state data of actinides and toxic materials, and provide data necessary to generate reliable computational models for predicting the material's behavior under extreme conditions. NTED is supporting this DNT Directorate activity through its high-velocity experimentation core competency.

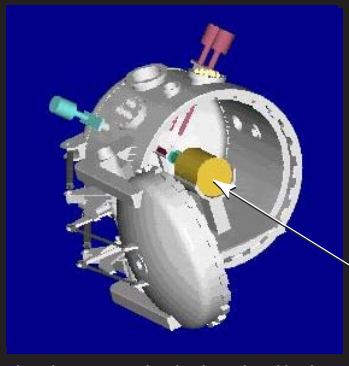


Aerial view of the JASPER Facility site.

The JASPER gas gun, similar in design and performance to the two-stage gas gun located in B341, will be capable of propelling a 15-gram projectile at 8 kilometers per second.

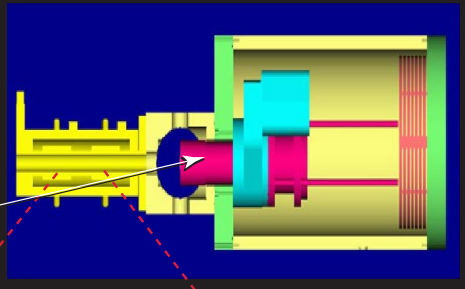


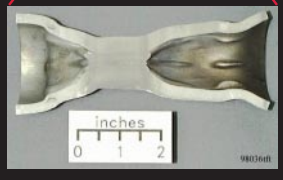
The JASPER two-stage light gas gun and containment chambers are depicted in this schematic diagram. Hot gases from the ignited propellant in the breech drive a 10-lb piston, compressing the hydrogen gas. The petal valve bursts at a predetermined pressure, allowing hydrogen gas to flow in behind the projectile and propelling it down the launch tube towards the target.



The primary target chamber is enclosed by the secondary containment chamber providing a nested containment configuration.

The primary target chamber houses the target material, providing primary containment of the actinide after projectile impact.





The ultrafast closure valve is activated just behind the projectile as it travels toward the target, imploding the 1.5-inch-diameter tube with high explosives and sealing the tube in less than 70 microseconds.

JASPER

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